# Interannual variability of zooplankton abundance in Lagoon Notoro-ko during 2010–2015

Yoshizumi Nakagawa[1], Mitsuaki Kitamura[2], Yasuto Nishino[1] and Susumu Segawa[1]

[1]*Faculty of Bioindustry, Tokyo University of Agriculture*
[2]*Graduate School of Bioindustry, Tokyo University of Agriculture*

Lagoon Notoro-ko is connected to the Okhotsk Sea by an artificial channel and sea ice covers with the sea surface in the lagoon during the winter. The fishery production in the lagoon is very high. This high fishery production could be supported by production of lower trophic organisms such as plankton. To sustain high fishery production in Lagoon Notoro-ko, it is necessary to understand a variability of plankton abundance and biomass in the lagoon on long-term basis as well as seasonal and diurnal basis. The present study aimed to clarify interannual variability of zooplankton abundance in Lagoon Notoro-ko during 2010‑2015. Samplings were carried out once or twice a month during ice-free period (April–December) from 2010 to 2015 at a sampling site, the deepest part (about 21-m depth) of Lagoon Notoro-ko. Zooplankton was collected by a vertical haul to the surface, from a depth of 15 m at a sampling point, using a NORPAC net (0.1-mm mesh size, 45-cm diameter, 180-cm length). The zooplankton samples were preserved in 5% buffered seawater formalin. The amount of water filtered by the NORPAC net was calculated from the rotation numbers on a flow meter attached to the net. Zooplankton were sorted under a dissecting microscope from 1/4 to 1/32 aliquots, and then numbers of individuals were counted. Water temperature and salinity is measured using a CTD. Integration average value from surface to 18-m depth of water temperature and salinity was calculated. Average values of water temperature, salinity and zooplankton abundance at each month during 2010-2015 were calculated and then deviation at each month was calculated from difference between average value and each month value. In the present study, the deviation data was used in analyses of their interannual variabilities. In Lagoon Notoro-ko, water mass changed seasonally; lower temperature and salinity water was found in spring and early winter, and higher temperature and salinity water was found in summer. Water temperature from early winter of 2012 to fall of 2014 was lower than average water temperature during 2010-2015, except for summer of 2013. Interannual variability of salinity showed similar pattern with that of water temperature. Total zooplankton abundances during 2010-2012 were higher than average value, and those during 2013-2015 were lower than average value. This variability was similar with copepods, bivalves, echinoderms, larvaceans, polychaetes, and fish larvae and eggs. Interannual variabilities of cnidarians and cladocerans were different from that of the previous zooplankton.